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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,246	02/24/2004	Helmut Lucke	450100-03060.1	8911

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EXAMINER	
LERNER, MARTIN	
ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/785,246	LUCKE ET AL.	
	Examiner	Art Unit	
	Martin Lerner	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 5 and 7 to 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 to 5 and 7 to 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/804,354.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Konuma et al.* in view of *Schwartz et al.*

Concerning independent claims 1, 7, and 8, *Konuma et al.* discloses a speech recognition apparatus, method and computer program, comprising:

"extraction means for extracting features of the input speech" – an utterance including a word uttered by a user is received, and the digital signal is analyzed in the acoustic feature analyzing unit 13, so that a string of acoustic feature parameters characterizing the uttered word is detected (column 7, lines 6 to 19: Figure 1; Figure 2: Step S104);

"storing means to store a dictionary database having a standard dictionary area and an unknown word dictionary area" – a series of acoustic feature parameters of a recognition-desired word is registered in the recognition word dictionary 15 ("a dictionary database having a standard dictionary area") (column 6, lines 40 to 55: Figure 1; Figure 2: Step S101); a series of acoustic feature parameters of a reception word differing from any recognition-desired words is registered in an out-of-vocabulary

unknown word dictionary 16 ("and an unknown word dictionary area") (column 6, line 56 to column 7, line 5: Figure 1; Figure 2: Step S102);

"calculation means to calculate the score . . . by using the extracted features on the basis of the unknown word dictionary area in which unknown-word-forming elements are stored, said elements forming a speech recognition result corresponding to an unknown word, and for classifying said speech recognition result by an attribute thereof" – word recognition score calculating unit 17 compares the string of acoustic feature parameters of the uttered word with the string of acoustic feature parameters of each recognition-desired word and with the string of acoustic feature parameters of each reception word to obtain recognition-desired word recognition scores and reception word recognition scores, respectively (column 7, lines 20 to 35: Figure 1; Figure 2: Steps S106 to S109); specifically, acoustic feature parameters compared with reception words are "on the basis of the unknown word dictionary area in which unknown-word-forming elements are stored" because reception words are registered in an out-of-vocabulary unknown word dictionary 16; recognition-desired words are registered in groups as affirmative words or denial words, or generally, classified into N groups of words (column 9, line 34 to column 10, line 15); a group classification of words as affirmative words or denial words is, broadly interpreted, "an attribute thereof"; group classification produces scores for recognition-desired affirmative word recognition scores, recognition-desired denial word recognition scores, and reception word recognition scores;

"selection means to select a word [sequence] of speech recognition results that represent the original input speech based on said score" – word recognizing unit 18 arranges scores in decreasing order, and recognizes a highest-scoring word as the recognized word (column 7, line 49 to column 8, line 1: Figure 2: Steps S110 and S111).

Concerning independent claims 1, 7, and 8, the only elements omitted by *Konuma et al.* are calculating a score "of a word sequence for each candidate for the unknown word sequence in the word sequence" and selecting a "word sequence" of the speech recognition results. *Konuma et al.* is directed to recognition of individual words, *e.g.* "on", "off", "up", "down", affirmative words, and denial words for controlling an electric apparatus. Thus, *Konuma et al.* omits calculating scores and selecting words for word sequences. However, it is well known that various techniques are employed for computing scores for words sequences from a plurality of individual words. Generally, a score for a word sequence is calculated by accumulating probabilities for individual words, and a word sequence is selected by a high scoring word sequence based on accumulated probabilities of individual words. *Schwartz et al.* teaches a word dependent N-best search method, where a one most likely word sequence is found by computing word theory probability scores for selected words to generate a combined probability for each partial sentence hypothesis. A separate combined probability score is accumulated for each of n most likely single previous word theories, and the N different word sequences with the highest accumulated scores are assembled. (Abstract; Column 3, Lines 40 to 59) An N-best search method provides a forward pass

by preserving probabilities for a few preceding words, and when the utterance is completed, N-best sentences are determined by chaining backwards and assembling the word sequence with the highest total probability. (Column 5, Lines 27 to 45) An objective is to obtain a system and method of determining the N-best sentence hypothesis from a spoken utterance that requires less computation yet retains similar accuracy. (Column 3, Lines 31 to 36) It would have been obvious to one having ordinary skill in the art to calculate scores for word sequences and to select a word sequence for speech recognition results as taught by *Schwartz et al.* in a method and apparatus for speech recognition and speech control of *Konuma et al.* for a purpose of determining an N-best sentence hypothesis with less computation and similar accuracy.

3. Claims 2 to 4 and 9 to 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Konuma et al.* in view of *Schwartz et al.* as applied to claims 1 and 7 above, and further in view of *Kanevsky et al.*

Konuma et al. omits classifying a speech recognition result by part of speech, and entering suffixes and phonemes in the unknown word dictionary area. However, *Kanevsky et al.* teaches speech recognition, where Slavonic and Japanese languages, characterized by inflection, are recognized by stems, prefixes, and endings. The objective is to compress the size of a vocabulary. (Column 1, Lines 8 to 33; Column 2, Lines 25 to 39) It would have been obvious to one having ordinary skill in the art to classify a speech recognition result by part of speech, and enter suffixes and phonemes into a word dictionary area as taught by *Kanevsky et al.* in a speech recognition method

and apparatus of *Konuma et al.* for the purpose of compressing the size of a vocabulary.

Concerning claims 2 and 9, *Kanevsky et al.* discloses each word 502 from vocabulary 501 is split by means of splitter 503 into a "stem ending" pair 504; this pair is analyzed by linguistic module 505 to classify its characteristics (part of speech of the original word, morphological characteristics, e.g. plural, whether it is an ending, suffix or end, and context characteristics (column 6, lines 31 to 47: Figure 5) ("for classifying . . . the unknown word by a part of speech thereof").

Concerning claims 3 and 10, *Kanevsky et al.* discloses each word 502 from vocabulary 501 is split by means of splitter 503 into a "stem ending" pair 504; this pair is analyzed by linguistic module 505 to classify its characteristics (part of speech of the original word, morphological characteristics, e.g. plural, whether it is an ending, suffix or end, and context characteristics (column 6, lines 31 to 47: Figure 5) ("wherein in the unknown word dictionary area, suffixes are entered as said unknown-word-forming elements").

Concerning claims 4 and 11, *Kanevsky et al.* discloses the pair is analyzed by linguistic module 505 to classify its characteristics (part of speech of the original word, morphological characteristics, e.g. plural, whether it is an ending, suffix or end, and context characteristics for each letter in the "stem ending" pair (e.g., before "hard" or "soft" phoneme); these characteristics are used by letter to phoneme mapper 506 that maps each letter to a phoneme (column 6, lines 31 to 65: Figure 5) ("wherein in the

unknown word dictionary area, phonemes that form the unknown word are entered together with the suffixes").

4. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Konuma et al.* in view of *Schwartz et al.* as applied to claims 1 and 7 above, and further in view of *Muthusamy et al.*

Konuma et al. discloses speech recognition for Chinese and Japanese (column 6, line 40 to column 7, line 5), but does not expressly disclose that words are classified by a language in a dictionary. However, *Muthusamy et al.* teaches an automatic language identification system where, given input speech in an unknown language, a plurality of speech recognizers 31a-31n, for English, Spanish, and Japanese languages, determine the likelihood that the speech came from the phonetic elements of each language. Each phoneme is given a likelihood score, and the highest score becomes the selected language. (Column 3, Lines 50 to 61: Figure 3) An objective is to provide an ability for telephone companies to cater to multilingual customer populations. (Column 1, Lines 8 to 27) It would have been obvious to one having ordinary skill in the art to classify words from Chinese and Japanese languages of *Konuma et al.* into one of a plurality of languages as suggested by *Muthusamy et al.* for the purpose of enabling telephone companies to cater to multilingual customer populations.

Response to Arguments

5. Applicants' arguments filed 01 August 2006 have been considered but are moot in view of the new grounds of rejection, necessitated by amendment.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

Alshawi et al. and Tran et al. disclose recognizing word phrases and sequences of words.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (571) 272-7608. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ML
9/5/06

Martin Lerner
Examiner
Group Art Unit 2626